

new & can
G 28420
S# 17332, 17333

17 APR 2008

In Reply To: MS 5232

Mr. Steve Wallace
Kerr-McGee Oil & Gas Corporation
1201 lake Robbins Drive
The Woodlands, Texas 77380

Dear Mr. Wallace:

Reference is made to the following application that has been reviewed by the Minerals Management Service:

Application Type: New Right-of-Way Pipeline

Application Date: March 28, 2008

Work Description: Create 200-foot wide right-of-way and install, operate, and maintain the following:

A 6.29 mile long 7-inch x 4-1/2-inch pipe-in-pipe pipeline (Southern Route) to transport bulk oil from a PLET (South Tie-Back) in Block 302 through Blocks 258, 259 to Platform "A" in Block 260, all located in Garden Banks Area.

Also requests the use of API RP 1111 for burst and collapse design.

Assigned Right-of-Way Number: OCS-G28420

Assigned Segment Number, Carrier Pipe: 17332

Assigned Segment Number, Casing Pipe: 17333

Pursuant to 43 U.S.C. 1334(e) and 30 CFR 250.1000(d), your application is hereby approved.

The approval is subject to the following:

1. There are several fault scarps along with proposed pipeline route. Include with your construction report a listing of the location and length of any pipeline "spanning" resulting from laying the pipeline over these fault scarps. Also include a description of any remedial action necessary to minimize "spanning" and prevent pipeline damage.

2. Our review indicates that your proposed pipeline route and/or the routes to be taken by boats and aircraft in support of your proposed activities are located in or could traverse (see the MMS Internet website at http://www.gomr.mms.gov/homepg/regulate/envirom/MWA_boundaries.pdf for a map of the areas). Contact the appropriate individual military command headquarters (see the MMS Internet website at

<http://www.gomr.mms.gov/homepg/regulate/envIRON/Military%20Contacts.pdf> for a list of the contacts) concerning the control of electromagnetic emissions and use of boats and aircraft in this area(s) before commencing such traffic.

Segment	MAOP	MAOP
No.	(psig)	Determination
-----	-----	-----
17332	12000	Hydrotest

Pursuant to 30 CFR 250.141, your request to utilize codes from API RP 1111 for design against burst of the pipeline due to internal operational pressure and collapse of the pipeline due to external hydrostatic pressure is hereby approved.

Please be reminded that, in accordance with 30 CFR 250.1008(a), you must notify the Regional Supervisor at least 48 hours prior to commencing the installation or relocation of a pipeline or conducting a pressure test on the pipeline. Commencement notification(s) should be faxed to (504) 736-2408. In accordance with 30 CFR 250.1008 (b), you are reminded to submit a report to the Regional Supervisor within 90 days after completion of any pipeline construction. Also in accordance with a Letter to Lessees dated April 18, 1991, a copy of the as-built plat(s) must be submitted to the National Ocean Service, N/CS26 Room 7317, 1315 E-W Highway, Silver Spring, MD 20910-3282

Sincerely,

(org. sgd.) A. Alvarez

Joe T. Gordon
Regional Supervisor
Field Operations

bcc: 1502-01 Segment No. 17332, 17333 ROW OCS-G28420 (MS 5232)
✓ 1502-01 ROW OCS-G28420 (Scanning) (MS 5033)
MS 5280 Lafayette District w/flow schematic
Bshrestha: Segment No. 17332, 17333



17332-33
ACAH

March 31, 2008

U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123-2394

Minerals Management Service
RECEIVED

APR 01 2008

Office of Field Operations
Pipeline Section

Attention: MS 5232

RE: Resubmittal of Segment Numbers 17332 and 17333
Application for a 7 inch x 4.5 inch pipe in pipe Oil / Natural Gas Right-of-Way Pipeline
(southern route) to be Installed in and/or Through Garden Banks Blocks 302, 258, 259
and 260, OCS Federal Waters, Gulf of Mexico, Offshore Louisiana

Gentlemen:

Pursuant to the authority granted in Section 5 (e) of the OCSLA (67 Stat. 462) (43 U.S.C. 1331), as amended (92 Sta. 629), and in compliance with regulations contained in Title 30 CFR Part 250, Subpart J, Kerr-McGee Oil & Gas Corporation (Kerr-McGee) is filing this application in quadruplicate (original and three copies) for a right-of-way two hundred feet (200') in width for the construction, maintenance and operation of a 7" x 4.5" O.D. oil/natural gas pipeline (southern route) to be installed in and/or through Blocks 302, 258, 259 and 260, Garden Banks Area, OCS Federal Waters, Offshore Louisiana. Kerr-McGee agrees that said right-of-way, if approved, will be subject to the terms and conditions of said regulations and will be bound by the provisions of the OCSLA, as amended.

The pipeline will be used to pig the northern production flowline to and from Hess Corporation's Baldpate Platform in Garden Banks Block 260. The pipeline will depart from a Garden Banks Block 302 PLET in a northeasterly direction and travel approximately 33,189.40' (6.29 miles) to the Baldpate Platform in Garden Banks Block 260. The pipeline will be located in a maximum water depth of 2,325 feet and a minimum water depth of 1,652 feet.

The associated jacket riser will be installed inside the jacket structure on the Baldpate platform. Thus, no additional structure shall be installed for riser protection.

Installation of the proposed pipeline will be accomplished by utilizing a dynamically positioning pipelay/support vessel. The proposed construction operations will not be supported by other vessels. Kerr-McGee will utilize the existing onshore support base in Fourchon, Louisiana for this operation. This established facility will require no modifications.

Kerr-McGee anticipates commencing installation operations on or about January 15, 2008, with an overall completion date of May, 2008.

The Engineering Hazard Study prepared by C & C Technologies in August, 2007, is submitted in quadruplicate as part of this application. In accordance with NTL 98-20, all unidentified anomalies will be avoided by 1) rerouting the line or 2) maintaining an adequate distance from such anomalies during construction operations; allowing Kerr-McGee to conduct operations in a safe and environmentally sound manner. All identified magnetic anomalies will be avoided during pipeline construction operations.

Kerr-McGee requests the following departures:

1. Kerr-McGee requests a waiver from NTL 98-20, Section IV.B; which requires the buoing of all existing pipelines and other potential hazards located within 150 meters (490') of the proposed operations. Kerr-McGee feels that the multi-sensor, high resolution survey conducted by C & C Technologies adequately outlines the proposed pipeline route, whereby potential hazards will be avoided.
2. The American National Standards Institute (ANSI) B31.8 design code and D.O.T Part 192, regulations will be used in setting the internal design pressure for the steel pipe. Where ANSI B31.8 does not provide specific guidance, a limit state design philosophy will be adopted. API RP 1111 will be referred to for internal and external pressure collapse calculations, as B31.8 does not adequately address these for deepwater applications. For this reason, Kerr-McGee requests approval for the utilization of API RP 1111 for the design against burst of the flowline due to internal operational pressure and collapse of the flowline due to external hydrostatic pressure. The calculations are attached for reference.
3. Kerr-McGee requests a waiver from recording magnetometer data as part of the shallow hazards survey in water depths beyond 600 feet.

Additionally, Kerr-McGee expressly agrees that if any site, structure, or object of historical or archaeological significance should be discovered during the conduct of any operations within the permitted right-of-way, we shall report immediately such findings to the Director, Gulf of Mexico, OCS Region, and make every reasonable effort to preserve and protect the cultural resource from damage until said Director has given direction as to its preservation.

In accordance with applicable regulations, we have forwarded information regarding the proposed project via UPS overnight mail to each designated oil and gas lease operator, right-of-way or easement holder whose lease, right-of-way or easement is so affected. A list of such designated operators, right-of-way or easement holders is included and copies of receipts showing date and signature as evidence of service upon such operators, right-of-way or easement holders will be forwarded to your office when received. In order to expedite the permit process, we have requested a letter of no objection from the operator, right-of-way or easement holder.

When obtained, these letters will be forwarded to your office. The proposed right-of-way does not adjoin or subsequently cross state submerged lands.

Upon issuance of a segment number to this pipeline application, Kerr-McGee will proceed with coverage of the right-of-way under the current Certificate of Oil Spill Financial Responsibility, as applicable. Kerr-McGee will be the operator of this R-O-W pipeline. Kerr-McGee will review our Regional Oil Spill Response Plan to determine if installation of the subject right-of-way pipeline affects the current worst case discharge, and, if applicable, will modify the Plan to include the pipeline at the next scheduled update.

In support of our application and for your review and use, the following maps, drawings and documents have been enclosed herewith and made a part hereof:

1. Nondiscrimination in Employment Stipulation, (one original and three copies)
2. Pay.Gov receipt in the amount of \$2,875.00 of which \$2,350 covers the application fee and \$525.00 for five years rental on 6.22 miles of right-of-way;
3. Designated Oil & Gas Lease Operators, Right-of-Way or Easement Holders
4. General Pipeline Information, Calculations and Construction Information, Worst Case Discharge Calculation
5. Pipeline Safety Flow Schematic
6. Vicinity Plat
7. Pipeline Plat with Profile
8. Louisiana CZM Consistency Certification
9. MMS Checklist for R-O-W Pipeline
9. Engineering and Hazard Study Site Survey and Proposed Flowline & Umbilical Routes (4 copies)

Also enclosed is one 3.5 Diskette with digital coordinates of key points of the proposed route in fixed format ASCII file, per NTL 98-09.

Contact on technical points or other information:

Judy Davidson
Anadarko Petroleum Corporation
1201 Lake Robbins Drive
The Woodlands, TX 77380
832-636-8766
e-mail: judy.davidson@anadarko.com

Kerr-McGee hereby certifies that the proposed activity described in this application complies with and will be conducted in a manner that is consistent with the Coastal Management Program for the State of Louisiana. A copy of this application has been forwarded to the State of Louisiana.

"Kerr-McGee hereby agrees to keep open at all reasonable times for inspection by the Minerals Management Service, the area covered by this right-of-way and all improvements, structures, and fixtures thereon and all records relative to the design, construction, operation, maintenance, and repairs, or investigations on or with regard to such area."

Please refer to your New Orleans Miscellaneous File No. 2219 for a copy of a resolution approved by the Board of Directors authorizing the undersigned to sign for and on behalf of Kerr-McGee Oil & Gas Corporation. Additionally, Kerr-McGee has an approved \$300,000 Right-of-Way Bond (Bond No. 2971100-2658) on file with MMS, covering installation of right-of-way pipelines in Federal Waters, Gulf of Mexico.

If the above information meets with your approval, we would appreciate your issuing the necessary decision for the right-of-way at your earliest convenience.

Sincerely,

Kerr-McGee Oil & Gas Corporation

A handwritten signature in black ink, appearing to read "Steve Wallace", written over a horizontal line.

Steve Wallace
Attorney-in-Fact

SW/JD

Attachments

UNITED STATES
DEPARTMENT OF THE INTERIOR
MINERALS MANAGEMENT SERVICE

NONDISCRIMINATION IN EMPLOYMENT

As a condition precedent to the approval of the granting of the subject pipeline right-of-way, the grantee, Kerr-McGee Oil & Gas Corporation hereby agrees and consents to the following stipulation which is to be incorporated into the application for said right-of-way.

During the performance of this grant, the grantee agrees as follows:

During the performance under this grant, the grantee shall fully comply with paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended (reprinted in 41 CFR 60-1.4(a)), which are for the purpose of preventing discrimination against persons on the basis of race, color, religion, sex or national origin. Paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended, are incorporated in this grant by reference.

Kerr-McGee Oil & Gas Corporation - Grantee



Steve Wallace
Attorney-in-fact

3/31/08
Date

Oil & Gas Lease Operators and Right-Of-Way Holders

A. Lease Operators

The following lease operators are being notified of the proposed pipeline route in accordance with the "No Objection" requirements:

BLOCK	LEASE	LEASE HOLDER
GARDEN BANKS - 302	OCS-G-24479	Kerr-McGee Oil & Gas Corporation
GARDEN BANKS - 258	OCS-G-27632	Kerr-McGee Oil & Gas Corporation
GARDEN BANKS - 259	OCS-G-07461	Hess Corporation
GARDEN BANKS - 260	OCS-G-07462	Hess Corporation

B. Pipeline Operators

The following pipeline operators are being notified of the proposed pipeline route in accordance with the "No Objection" requirements:

ROW HOLDER	PIPELINE SIZE/PRODUCT	OCS ROW NO.	SEG. NO.	AREA/BLOCK
None				

COASTAL ZONE MANAGEMENT PROGRAM
CONSISTENCY CERTIFICATION

From Garden Banks Block 302

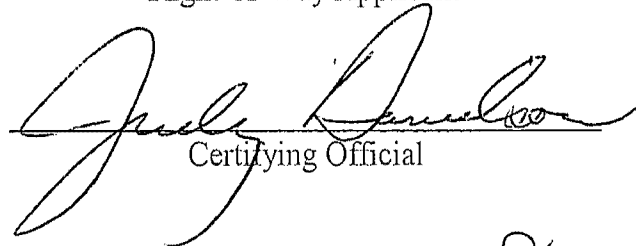
To Garden Banks Block 260 Platform A

6.29

Length (miles)

The proposed activities described in detail in this right-of-way pipeline application comply with the enforceable policies of Louisiana's approved Coastal Management Program(s) and will be conducted in a manner consistent with such Program(s).

Kerr-McGee Oil & Gas Corporation
Right-of-Way Applicant


Certifying Official

3-31-2008

Date

Southern Right-of-Way
PIGGING LOOP, PIGGING JUMPER, JACKET RISER AND SCR SPECIFICATIONS
KERR-MCGEE OIL & GAS CORPORATION
7-INCH X 4.5-INCH PIPE-IN-PIPE FLOWLINE SYSTEM WITH PIGGING LOOP AND JUMPER
Garden Banks Block 258 Well No. 2 ST02BP01 TO GARDEN BANKS BLOCK 260 PLATFORM 'A'

A. INTRODUCTION

This proposed 7-inch x 4.5-inch pipe in pipe flowline will be utilized to pig the production flowline to and from Hess Corporation's Baldpate Platform located in Garden Banks Block 260, Gulf of Mexico. This pipe in pipe flowline is part of the flowline system known as the Power Play Project, and is shown on the attached Safety Flow Schematic.

B. DESIGN INFORMATION

Design of the flowline system will be in accordance with 30 CFR 250 and API RP 1111. The maximum wellhead Shut-in Tubing Pressure (SITP) of any source for this flowline is 9,500 psig for Sand A and 9,300 for Sand B. When applicable, the effects of external pressure in the design are considered.

1. Product to be transported: Gas Condensate (A-Sand Reservoir)
Black Oil (B-Sand Reservoir)
2. Jacket Riser, SCR, Flowline, and Jumper Specifications:

PARAMETER	JACKET RISER CASING	JACKET RISER CARRIER	JACKET RIGID RISER	SCR
Elevation (ft)	+20 to -12	+20 to -12	N/A	N/A
Water Depth Range (ft)	0-12	0-12	12-216	216-1652
Length (ft)	32	34	208	2,627
Outside Diameter (in)	8.625	4.5	4.5	4.5
Wall Thickness (in)	0.5	0.648	0.648	0.648
Material	API-5L	API-5L	API-5L	API-5L
Grade	X-52	X-65	X-65	X-65

Southern Right-of-Way
PIGGING LOOP, PIGGING JUMPER, JACKET RISER AND SCR SPECIFICATIONS
KERR-MCGEE OIL & GAS CORPORATION
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Garden Banks Block 258 Well No. 2 ST02BP01 TO GARDEN BANKS BLOCK 260 PLATFORM 'A'

PARAMETER	PIGGING JUMPER	FLOWLINE (Carrier)	FLOWLINE (Casing)
Water Depth Range (ft)	2325	1652-2325	1652-2325
Length (ft)	130	31,654	31,654
Outside Diameter (in)	6.625	4.5	7.625
Wall Thickness (in)	0.971	0.586	0.475
Material	API 5L	API 5L	API 5L
Grade	X-70	X-65	X-65

Specific design data for the Steel Catenary Riser (SCR) can be found in Attachment "J", the SCR design summary.

3. Type of Cathodic Protection:

- a. Sacrificial Anode System (560 foot spacing)
 - b. Type of Anode: Aluminum-Indium-Zinc Alloy
 - c. Two (2) additional anodes will be placed at each end of the pipeline. The flowline / SCR interface will have two (2) anodes on each joint for first four joints to protect the length of the SCR.
 - d. Unit weight of anode: 84 lbs.
 - e. Platform anodes will not be used to protect the pipeline.
 - f. Pipeline anode life: 20 years minimum.

Based on the formula: $Le(p/1) = 3.82 \times 10^4 \times wo/DIR$

Where:

$Le(p/1)$ = Life expectancy (years)
 wo = Weight of anode unit (lbs)
 D = Diameter of pipe (inches)
 I = Separation between anodes (ft)
 R = Rate of consumption (lbs/amp year)= 7.42 lbs/amp year

7.625-inch Pipeline

$$Le(p/1) = (3.82 \times 10^4)(84)/[(7.625)(560)(7.42)] = 101 \text{ years}$$

4. Water Depth: Minimum of 1652 ft at riser location in GB 260.
Maximum of 2325 ft at the subsea well location in GB 320.

5. Description of Protective Coating:

- a. Flowline Casing: Fusion Bonded Epoxy, 14-16 mils
- b. Flowline Carrier: Fusion Bonded Epoxy, 10 mils & 0.55 inch of Aerogel
- c. Jacket Riser & Jumper: Fusion Bonded Epoxy, 14-16 mils & 2-inches of GSPU
- d. Jacket Riser Casing (Splash zone): Fusion Bonded Epoxy, 14-16 mils & 1/8" of antifouling

Southern Right-of-Way

PIGGING LOOP, PIGGING JUMPER, JACKET RISER AND SCR SPECIFICATIONS

KERR-MCGEE OIL & GAS CORPORATION

7-INCH X 4.5-INCH PIPE-IN-PIPE FLOWLINE SYSTEM WITH PIGGING LOOP AND JUMPER

Garden Banks Block 258 Well No. 2 ST02BP01 TO GARDEN BANKS BLOCK 260 PLATFORM 'A'

protection coating.

NOTE: GSPU is Glass Syntactic Polyurethane

6. Internal Corrosion Protection: The pipeline will be monitored for corrosion and a chemical injection program instituted if necessary. The pipeline will be designed for pigging.
7. Specific Gravity: $SG = \text{weight in air (empty)} / \text{water displacement (in seawater)}$

Description	Air Weight (lb/ft)	Water Displacement (lb/ft)	Submerged Empty Weight (lb/ft)	SG (Empty)	Submerged Weight w/ Product (lb/ft)	SG (Filled with Product)
Flowline Carrier: with 10 mils FBE & 0.55 inch of Aerogel	25.10	11.03	14.08	2.277	17.40	2.578
Flowline Casing: with 14-16 mils FBE	36.55	20.47	16.08	1.786	29.45	2.439
Jacket Riser / SCR: with 14-16 mils FBE & 2 inches GSPU	41.08	25.41	15.67	1.617	18.75	1.738
Jacket Riser (Casing): with 14-16 mils FBE 1/8" antifouling coating	43.70	27.69	16.01	1.578	33.45	2.208
Jacket Riser (Casing): With 14-16 mils FBE and Insulation	36.70	19.80	16.89	1.853	19.97	2.009
Jumper: with 14-16 mils FBE & 2 inches GSPU	77.78	39.64	38.14	1.962	44.72	2.128

8. Product Characteristics

Sand A:

Gas SG = 0.735 (Air = 1.0)
API = 35.1
Density = 55 lb/ft³ (at P&T)
Maximum Temperature = 167° F
Fluid GOR = 3730 scf/stb

Sand B:

Gas SG = 0.670 (Air = 1.0)
API = 30.1
Density = 55 lb/ft³ (at P&T)
Maximum Temperature = 165° F
Fluid GOR = 2190 scf/stb

9. Anticipated Flowrates:

Sand A: 20 MMSCFD

Southern Right-of-Way
 PIGGING LOOP, PIGGING JUMPER, JACKET RISER AND SCR SPECIFICATIONS
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 Garden Banks Block 258 Well No. 2 ST02BP01 TO GARDEN BANKS BLOCK 260 PLATFORM 'A'

5840 BOPD

Sand B: 12.35 MMSCFD
 6000 BOPD

10. Flowline System Shut-in Pressure:

The following calculations determine the shut-in pressures between the (+) 100-ft. elevation at the host platform (GB-260) and the base of the flowline (-) 2,325-ft. For conservatism, the maximum shut-in tubing pressure for any source is utilized and a conservative Methane gas unit weight at shut-in tubing pressure of 15 lb/ft³ is assumed.

Sand A:

$$\Rightarrow P_{shut-in} = 9,500 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (\Delta \text{Elevation from max wd}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right)$$

$$\text{Host Platform +100 MSL} \Rightarrow P_{shut-in} = 9,500 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (2,425 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,247 \text{ psig}$$

$$\text{Jacket Riser -0 fsw} \Rightarrow P_{shut-in} = 9,500 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (2,325 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,257 \text{ psig}$$

$$\text{Jacket Riser - 13 fsw} \Rightarrow P_{shut-in} = 9,500 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (2,312 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,259 \text{ psig}$$

$$\text{SCR - 219 fsw} \Rightarrow P_{shut-in} = 9,500 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (2,106 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,280 \text{ psig}$$

$$\text{SCR - 1,652 fsw} \Rightarrow P_{shut-in} = 9,500 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (673 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,429 \text{ psig}$$

$$\text{Flowline - 1,652 fsw} \Rightarrow P_{shut-in} = 9,500 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (673 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,429 \text{ psig}$$

$$\text{Flowline - 2,325 fsw} \Rightarrow P_{shut-in} = 9,500 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (0 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,500 \text{ psig}$$

$$\text{Pigging Jumper - 2,325 fsw} \Rightarrow P_{shut-in} = 9,500 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (0 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,500 \text{ psig}$$

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 PIGGING LOOP, PIGGING JUMPER, JACKET RISER AND SCR SPECIFICATIONS
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 Garden Banks Block 258 Well No. 2 ST02BP01 TO GARDEN BANKS BLOCK 260 PLATFORM 'A'

Sand B:

$$\Rightarrow P_{shut-in} = 9,300 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (\Delta \text{Elevation from max wd}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right)$$

$$\text{Host Platform +100 MSL} \Rightarrow P_{shut-in} = 9,300 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (2,425 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,047 \text{ psig}$$

$$\text{Jacket Riser -0 fsw} \Rightarrow P_{shut-in} = 9,300 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (2,325 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,057 \text{ psig}$$

$$\text{Jacket Riser -13 fsw} \Rightarrow P_{shut-in} = 9,300 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (2,312 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,059 \text{ psig}$$

$$\text{SCR -219 fsw} \Rightarrow P_{shut-in} = 9,300 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (2,106 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,080 \text{ psig}$$

$$\text{SCR -1,652 fsw} \Rightarrow P_{shut-in} = 9,300 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (673 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,229 \text{ psig}$$

$$\text{Flowline -1,652 fsw} \Rightarrow P_{shut-in} = 9,300 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (673 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,229 \text{ psig}$$

$$\text{Flowline -2,325 fsw} \Rightarrow P_{shut-in} = 9,300 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (0 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,300 \text{ psig}$$

$$\text{Pigging Jumper -2,325 fsw} \Rightarrow P_{shut-in} = 9,300 \text{ psig (Wellhead Shut-in Tubing Pressure)} - (0 \text{ ft}) \left(\frac{15 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) = 9,300 \text{ psig}$$

11. Hydrostatic Test Pressure and Maximum Allowable Operating Pressure:

The Hydrostatic Test pressure and duration at the (+) 100-ft elevation at the Host platform will be 15,000 psig and 8 hours respectively. This test pressure is based on the meeting 125% of the Maximum Allowable Operating Pressure of 12,000 psig. The maximum hydrostatic test pressure for the flowline system at the host will be set at 15,300 psig.

Hydrostatic Test Pressure

The Hydrostatic test pressure range of 15,000 psig (minimum) and 15,300 psig (maximum) will be maintained at the (+) 100-ft. elevation. The calculations below show the actual hydrostatic test pressure range at all locations along the flowline, accounting for seawater as the hydrotest medium (64 lb/ft³).

Minimum Hydrostatic test Pressure (15,000 psig)

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$$\Rightarrow P_{min\,hyd} = 15,000 \text{ psig} + (\Delta\text{Elevation from (+)100 ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right)$$

$$\text{Host Platform + 100 MSL} \Rightarrow P_{min\,hyd} = 15,000 \text{ psig} + (0 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 15,000 \text{ psig}$$

$$\text{Jacket Riser -0 fsw} \Rightarrow P_{min\,hyd} = 15,000 \text{ psig} + (100 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 15,044 \text{ psig}$$

$$\text{Jacket Riser -13 fsw} \Rightarrow P_{min\,hyd} = 15,000 \text{ psig} + (113 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 15,050 \text{ psig}$$

$$\text{SCR -219 fsw} \Rightarrow P_{min\,hyd} = 15,000 \text{ psig} + (319 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 15,141 \text{ psig}$$

$$\text{SCR - 1,652 fsw} \Rightarrow P_{min\,hyd} = 15,000 \text{ psig} + (1,752 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 15,778 \text{ psig}$$

$$\text{Flowline - 1,652 fsw} \Rightarrow P_{min\,hyd} = 15,000 \text{ psig} + (1,752 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 15,778 \text{ psig}$$

$$\text{Flowline - 2,325 fsw} \Rightarrow P_{min\,hyd} = 15,000 \text{ psig} + (2,425 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 16,077 \text{ psig}$$

$$\text{Pigging Jumper - 2,325 fsw} \Rightarrow P_{min\,hyd} = 15,000 \text{ psig} + (2,425 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 16,077 \text{ psig}$$

Maximum Hydrostatic test Pressure (15,300 psig)

$$\Rightarrow P_{min\,hyd} = 15,300 \text{ psig} + (\Delta\text{Elevation from (+)100 ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right)$$

$$\text{Host Platform + 100 MSL} \Rightarrow P_{min\,hyd} = 15,300 \text{ psig} + (0 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 15,300 \text{ psig}$$

$$\text{Jacket Riser -0 fsw} \Rightarrow P_{min\,hyd} = 15,300 \text{ psig} + (100 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 15,344 \text{ psig}$$

$$\text{Jacket Riser -13 fsw} \Rightarrow P_{min\,hyd} = 15,300 \text{ psig} + (113 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 15,350 \text{ psig}$$

$$\text{SCR -219 fsw} \Rightarrow P_{min\,hyd} = 15,300 \text{ psig} + (319 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 15,441 \text{ psig}$$

$$\text{SCR - 1,652 fsw} \Rightarrow P_{min\,hyd} = 15,300 \text{ psig} + (1,752 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 16,078 \text{ psig}$$

$$\text{Flowline - 1,652 fsw} \Rightarrow P_{min\,hyd} = 15,300 \text{ psig} + (1,752 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 16,078 \text{ psig}$$

$$\text{Flowline - 2,325 fsw} \Rightarrow P_{min\,hyd} = 15,300 \text{ psig} + (2,425 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 16,377 \text{ psig}$$

$$\text{Pigging Jumper - 2,325 fsw} \Rightarrow P_{min\,hyd} = 15,300 \text{ psig} + (2,425 \text{ ft})\left(\frac{64 \text{ lb}}{ft^3}\right)\left(\frac{ft^2}{144 \text{ in}^2}\right) = 16,377 \text{ psig}$$

Effective Hydrostatic Test Pressure

Allowing for external pressure differential, the effective hydrostatic test pressures at any location of the

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flowline are calculated below.

Minimum Effective Hydro Test Pressure (15,000 psig):

$$\Rightarrow P_{eff\ hyd} = P_{min\ hyd} - \text{Water Depth (ft)} \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right)$$

$$\text{Host Platform +100 MSL} \Rightarrow P_{eff\ hyd} = 15,000\ psig - (0\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,000\ psig$$

$$\text{Jacket Riser -0 fsw} \Rightarrow P_{eff\ hyd} = 15,044\ psig - (0\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,044\ psig$$

$$\text{*Jacket Riser -13 fsw} \Rightarrow P_{eff\ hyd} = 15,050\ psig - (0\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,050\ psig$$

$$\text{SCR -219 fsw} \Rightarrow P_{eff\ hyd} = 15,141\ psig - (219\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,043\ psig$$

$$\text{SCR - 1,652 fsw} \Rightarrow P_{eff\ hyd} = 15,778\ psig - (1,652\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,043\ psig$$

$$\text{*Flowline - 1,652 fsw} \Rightarrow P_{eff\ hyd} = 15,778\ psig - (0\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,778\ psig$$

$$\text{*Flowline - 2,325 fsw} \Rightarrow P_{eff\ hyd} = 16,077\ psig - (0\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 16,077\ psig$$

$$\text{Pigging Jumper - 2,325 fsw} \Rightarrow P_{eff\ hyd} = 16,077\ psig - (2,325\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,043\ psig$$

* Pipe in Pipe segment therefore no allowance for external hydrostatic pressure.

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Maximum Effective Hydro Test Pressure (15,300 psig):

$$\Rightarrow P_{eff\ hyd} = P_{min\ hyd} - \text{Water Depth (ft)} \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right)$$

$$\text{Host Platform + 100 MSL} \Rightarrow P_{eff\ hyd} = 15,300\ psig - (0\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,300\ psig$$

$$\text{Jacket Riser -0 fsw} \Rightarrow P_{eff\ hyd} = 15,344\ psig - (0\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,344\ psig$$

$$\text{*Jacket Riser -13 fsw} \Rightarrow P_{eff\ hyd} = 15,350\ psig - (0\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,350\ psig$$

$$\text{SCR -219 fsw} \Rightarrow P_{eff\ hyd} = 15,441\ psig - (219\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,343\ psig$$

$$\text{SCR - 1,652 fsw} \Rightarrow P_{eff\ hyd} = 16,078\ psig - (1,652\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,343\ psig$$

$$\text{*Flowline - 1,652 fsw} \Rightarrow P_{eff\ hyd} = 16,078\ psig - (0\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 16,078\ psig$$

$$\text{*Flowline - 2,325 fsw} \Rightarrow P_{eff\ hyd} = 16,377\ psig - (0\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 16,377\ psig$$

$$\text{Pigging Jumper - 2,325 fsw} \Rightarrow P_{eff\ hyd} = 16,377\ psig - (2,325\ ft) \left(\frac{64\ lb}{ft^3} \right) \left(\frac{ft^2}{144\ in^2} \right) = 15,343\ psig$$

* Pipe in Pipe segment therefore no allowance for external hydrostatic pressure.

The maximum effective hydrostatic test pressure will be utilized to verify the requirement of maintaining an internal pressure design factor of 0.75 for risers and 0.90 for flowlines in the flowline system (section 14).

Design Hydrostatic System Test Pressure: = 15,000 psig minimum
 = 15,300 psig maximum
 Hold Time = 8 hours minimum

12. Internal Design Pressure of Flowline, Jacket Riser, SCR and Jumper:

The flowline, SCR and jumper pipe design pressure and subsequent pipe wall thickness requirements are based on the design equation as required in API RP 1111, Subpart 4.3.1: Internal Pressure (Burst) Design. The maximum shut-in tubing pressure at any wellhead source is 9,500 psig for Sand A and 9,300 psig for Sand B and the maximum design pressure for the flowline system is 12,000 psig. The calculations below are for:

- Flowline (All Locations)
- SCR (All Locations)
- Jacket Riser
- Jumper

For line segment, the minimum water depth is utilized to determine the external pressure, yielding the most conservative result.

Design Pressure (Pd) of Flowlines,:

$$f_d = 0.90$$

$$f_e = 1.0$$

$$f_l = 1.0$$

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$$S = 65,000$$

$$U = 77,000$$

$$D = 4.5$$

$$D_i = 3.328$$

$$P_d = 0.80 * f_d f_e f_i \left(0.45(S + U) \ln \frac{D}{D_i} \right) \text{ API 1111, 3rd Edition}$$

$$\text{Flowline} \Rightarrow P_d = 0.8 * 0.9 * 1.0 * 1.0 \left(0.45(65,000 + 77,000) \ln \frac{4.5}{3.328} \right) = 13,880 \text{ psig}$$

Design Pressure (P) of Jacket Risers:

$$f_d = 0.75$$

$$f_e = 1.0$$

$$f_i = 1.0$$

$$S = 65,000$$

$$U = 77,000$$

$$D = 4.5$$

$$D_i = 3.204$$

$$P_d = 0.80 * f_d f_e f_i \left(0.45(S + U) \ln \frac{D}{D_i} \right) \text{ API 1111, 3rd Edition}$$

$$\text{Jacket Riser} \Rightarrow P_d = 0.8 * 0.75 * 1.0 * 1.0 \left(0.45(65,000 + 77,000) \ln \frac{4.5}{3.204} \right) = 13,023 \text{ psig}$$

Design Pressure (P) of Pigging Jumper:

$$f_d = 0.90$$

$$f_e = 1.0$$

$$f_i = 1.0$$

$$S = 70,000$$

$$U = 82,000$$

$$D = 6.625$$

$$D_i = 4.683$$

$$P_d = 0.80 * f_d f_e f_i \left(0.45(S + U) \ln \frac{D}{D_i} \right) \text{ API 1111, 3rd Edition}$$

$$\text{Pigging Jumpers} \Rightarrow P_d = 0.8 * 0.90 * 1.0 * 1.0 \left(0.45(70,000 + 82,000) \ln \frac{6.625}{4.683} \right) = 17,084 \text{ psig}$$

13. Design Pressure (P) of Flanges, Fittings and Valves in Flowline and Jacket Riser:

▪ Valves:	API Rating:	15,000 #
▪ Flanges, Connectors, etc:	API Rating:	15,000 #

14. Pipeline Combined Loads During Hydrotest:

In order to verify the internal pressure design factors based API RP 1111 are not exceeded during hydrotesting, the calculations below were performed for each location along the riser and flowline

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system. The maximum effective hydrostatic test pressures determined in section 11 above was utilized.

$$\Rightarrow \frac{P_{eff\ hyd}}{(f_e f_i) \left(0.45(S+U) \ln \frac{D}{D_i} \right)} \leq f_d$$

Host Platform + 100 MSL $\Rightarrow \frac{15,300}{(1.0*1.0) \left(0.45(65,000+77,000) \ln \frac{4.5}{3.204} \right)} = 0.70 \leq 0.75$

Jacket Riser - 0 fsw $\Rightarrow \frac{15,344}{(1.0*1.0) \left(0.45(65,000+77,000) \ln \frac{4.5}{3.204} \right)} = 0.71 \leq 0.75$

*Jacket Riser - 13 fsw $\Rightarrow \frac{15,350}{(1.0*1.0) \left(0.45(65,000+77,000) \ln \frac{4.5}{3.204} \right)} = 0.71 \leq 0.75$

SCR - 219 fsw $\Rightarrow \frac{15,343}{(1.0*1.0) \left(0.45(65,000+77,000) \ln \frac{4.5}{3.204} \right)} = 0.71 \leq 0.75$

SCR - 1,652 fsw $\Rightarrow \frac{15,343}{(1.0*1.0) \left(0.45(65,000+77,000) \ln \frac{4.5}{3.204} \right)} = 0.71 \leq 0.75$

*Flowline - 1,652 fsw $\Rightarrow \frac{16,078}{(1.0*1.0) \left(0.45(65,000+77,000) \ln \frac{4.5}{3.328} \right)} = 0.83 \leq 0.90$

*Flowline - 2,325 fsw $\Rightarrow \frac{16,377}{(1.0*1.0) \left(0.45(65,000+77,000) \ln \frac{4.5}{3.328} \right)} = 0.85 \leq 0.90$

Pigging Jumper - 2,325 fsw $\Rightarrow \frac{16,377}{(1.0*1.0) \left(0.45(70,000+82,000) \ln \frac{6.625}{4.683} \right)} = 0.69 \leq 0.90$

* Pipe in Pipe segment therefore no allowance for external hydrostatic pressure.

where:

f_e = weld joint factor, longitudinal or spiral seam welds

f_i = temperature de-rating factor

f_d = internal pressure (burst) design factor: 0.90 for pipelines and 0.75 for risers

S = Specified minimum yield strength

U = Ultimate Tensile yield strength

D = Outer pipeline diameter

D_i = Inner pipeline diameter

15. Riser Protection: From the top of the SCR, piping for the riser will be located within the confines of the production platform structure and thus protected by the host structure. Therefore, "Riser Guards" will not be required.
16. On Bottom Stability: Stability against effects of water currents and storms has been evaluated. The specific gravity of the operational oil pipeline is more than adequate to ensure on-bottom pipeline stability in these water depths.
17. Pipeline Spanning: A pipeline span analysis has been conducted along the entire route. Although the analysis indicates the possible existence of pipeline spans after installation, these spans are within allowable limits for installation, operation and hydrostatic testing. The analysis accounts for static and

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dynamic stresses as well as vortex induced vibrations. All stresses for installation, operation and hydrostatic testing are within allowable limits. The potential spans lengths identified are short enough such that Vortex Induced Vibrations (VIV) are not expected. Should spans which exceed allowable limits be found after installation, these will be rectified with placement of intermediate supports, or VIV suppression.

18. Collapse Due to External Pressure: The riser and flowline pipe has been designed to resist collapse due to external pressure. Evaluation has been performed in accordance with API Recommended Practice 1111 (Third Edition). The evaluations for both the riser pipe and flowline pipes were conducted based on the maximum associated water depth. Results are provided below:

Jacket Riser Pipe:

P_e = External Pressure (Sea Water Hydrostatic Pressure)

$$P_e = (D_{H_2O})(\rho\rho_{H_2O})$$

D_{H_2O} = Water Depth (ft)

$\rho\rho_{H_2O}$ = Sea Water Density ($64 \frac{\text{lb}}{\text{ft}^3}$)

$$P_e = \left[(2,325 \text{ ft}) \left(\frac{64 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) \right] = 1,033.3 \frac{\text{lb}}{\text{in}^2}$$

$$P_e = 1,033 \text{ psi}$$

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$$P_s = \frac{(P_y)(P_{ins})}{\sqrt{(P_y^2 + P_{ins}^2)}} = \text{Collapse Pressure of Pipe}$$

$$P_y = \text{Plastic Yield Pressure} = \frac{2St}{D}$$

$$S = \text{Pipe Yield Strength} \left(\frac{\text{lb}}{\text{in}^2} \right) = 65,000 \frac{\text{lb}}{\text{in}^2}$$

$$t = \text{Pipe Wall Thickness (in)} = 0.648 \text{ in}$$

$$D = \text{Pipe Outside Diameter (in)} = 4.5 \text{ in}$$

$$P_y = \left(\frac{2}{1} \right) \left(\frac{65,000 \text{ lb}}{\text{in}^2} \right) \left(\frac{0.648 \text{ in}}{1} \right) \left(\frac{1}{4.5 \text{ in}} \right) = 18,720 \frac{\text{lb}}{\text{in}^2}$$

$$P_y = 18,720 \text{ psi}$$

$$P_{ins} = \text{Elastic Instability Pressure} = (2.2)(E) \left(\frac{t}{D} \right)^3$$

$$E = \text{Elastic Modulus} = 29,000,000 \frac{\text{lb}}{\text{in}^2} \text{ (for steel)}$$

$$P_{ins} = (2.2) \left(\frac{29,000,000 \text{ lb}}{\text{in}^2} \right) \left(\frac{0.648 \text{ in}}{4.5 \text{ in}} \right)^3 = 190,505.8 \frac{\text{lb}}{\text{in}^2}$$

$$P_{ins} = 190,506 \text{ psi}$$

$$P_s = \frac{(18,720 \frac{\text{lb}}{\text{in}^2})(190,506 \frac{\text{lb}}{\text{in}^2})}{\sqrt{((18,720 \frac{\text{lb}}{\text{in}^2})^2 + (190,506 \frac{\text{lb}}{\text{in}^2})^2)} = 18,630.3 \frac{\text{lb}}{\text{in}^2}$$

$$P_s = 18,630 \text{ psi}$$

$$\text{Safety Factor Against Casing Collapse} = \frac{P_s}{P_c} = \frac{18,630 \text{ psi}}{1,033 \text{ psi}} = 18.0 \Rightarrow \text{OK: Safety Factors} > 1.5 \text{ are adequate}$$

Flowline Pipe:

It is assume once the casing pipe fails the carrier pipe is subjected to collapse.

$$P_c = \text{External Pressure (Sea Water Hydrostatic Pressure)}$$

$$P_c = (D_{H_2O})(\rho \rho_{H_2O})$$

$$D_{H_2O} = \text{Water Depth (ft)}$$

$$\rho \rho_{H_2O} = \text{Sea Water Density} \left(\frac{\text{lb}}{\text{ft}^3} \right)$$

$$P_c = \left[(2,325 \text{ ft}) \left(\frac{64 \text{ lb}}{\text{ft}^3} \right) \left(\frac{\text{ft}^2}{144 \text{ in}^2} \right) \right] = 1,033.3 \frac{\text{lb}}{\text{in}^2}$$

$$P_c = 1,033 \text{ psi}$$

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$$P_s = \frac{(P_y)(P_{ins})}{\sqrt{(P_y^2 + P_{ins}^2)}} = \text{Collapse Pressure of Pipe}$$

$$P_y = \text{Plastic Yield Pressure} = \frac{2St}{D}$$

$$S = \text{Pipe Yield Strength (lb/in}^2\text{)} = 65,000 \text{ lb/in}^2$$

$$t = \text{Pipe Wall Thickness (in)} = 0.586 \text{ in}$$

$$D = \text{Pipe Outside Diameter (in)} = 4.5 \text{ in}$$

$$P_y = \left(\frac{2}{1}\right) \left(\frac{65,000 \text{ lb}}{\text{in}^2}\right) \left(\frac{0.586 \text{ in}}{1}\right) \left(\frac{1}{4.5 \text{ in}}\right) = 16,929 \text{ lb/in}^2$$

$$P_y = 16,929 \text{ psi}$$

$$P_{ins} = \text{Elastic Instability Pressure} = (2.2)(E) \left(\frac{t}{D}\right)^3$$

$$E = \text{Elastic Modulus} = 29,000,000 \text{ lb/in}^2 \text{ (for steel)}$$

$$P_{ins} = (2.2) \left(\frac{29,000,000 \text{ lb}}{\text{in}^2}\right) \left(\frac{0.586 \text{ in}}{4.5 \text{ in}}\right)^3 = 140,889 \text{ lb/in}^2$$

$$P_{ins} = 140,889 \text{ psi}$$

$$P_s = \frac{(16,929 \text{ lb/in}^2)(140,889 \text{ lb/in}^2)}{\sqrt{((16,929 \text{ lb/in}^2)^2 + (140,889 \text{ lb/in}^2)^2)}} = 16,808.1 \text{ lb/in}^2$$

$$P_s = 16,808 \text{ psi}$$

$$\text{Safety Factor Against Casing Collapse} = \frac{P_s}{P_c} = \frac{16,808 \text{ psi}}{1,033 \text{ psi}} = 16.3 \Rightarrow \text{OK: Safety Factors } > 1.5 \text{ are adequate}$$

- 19.0 Buckle Arrestor Requirement: According to API 1111, the hydrostatic pressures at which buckle propagation will occur is given for the SCR pipe and casing pipe.

SCR Pipe:

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Flowline Casing Pipe:

$$P_o - P_i \geq f_p P_p$$

$$P_e = \text{External Hydrostatic Pressure } \left(\frac{\text{lb}}{\text{in}^2} \right)$$

$$P_e = 1,033 \text{ psi}$$

$$P_i = \text{Internal Pressure in the Pipe } \left(\frac{\text{lb}}{\text{in}^2} \right)$$

$$= 0 \text{ psi}$$

$$f_p = \text{Propagating buckle design factor} = 0.80$$

$$S = \text{Pipe Yield Strength } \left(\frac{\text{lb}}{\text{in}^2} \right) = 65,000 \frac{\text{lb}}{\text{in}^2}$$

$$t = \text{Pipe Wall Thickness (in)} = 0.475 \text{ in}$$

$$D = \text{Pipe Outside Diameter (in)} = 7.625 \text{ in}$$

$$P_p = \text{Buckle Propagation Pressure} = 24S \left[\frac{t}{D} \right]^{2.4}$$

$$P_p = (24) \left(\frac{65,000 \text{ lb}}{\text{in}^2} \right) \left[\frac{0.475 \text{ in}}{7.625 \text{ in}} \right]^{2.4} = 1,994.4 \frac{\text{lb}}{\text{in}^2}$$

$$P_p = 1,995 \text{ psi}$$

$$P_o - P_i \geq f_p P_p$$

$$\text{Safety Factor Against Casing Buckling} = \frac{f_p P_p}{P_o - P_i} = \frac{(0.80)(1,995 \text{ psi})}{1,033 \text{ psi} - 0 \text{ psi}} = 1.54 \Rightarrow \text{OK: Safety Factors} > 1.0 \text{ are adequate}$$

20. Pipeline Crossings: There are no crossings of existing pipelines associated with this installation.
21. Worst Case Discharge: Worst case oil spill calculations take into account oil trapped in the pipeline. The potential "worst case" calculation is summarized below:

System leak detection plus shutdown response time:	0.0125 hours
Predicted oil flow rate:	6000 bopd
Volume that escape flowline:	3 bbl
Volume in Flowline:	308 bbl
Worst Case Discharge:	311 bbl

22. Steel Catenary Riser

The SCR riser will be designed for a minimum life of 20-years with a minimum fatigue life of 200-years, providing a factor of safety against fatigue of 10. In order to reduce the Vortex Induced Vibration contribution to the fatigue damage, Fairings will be installed on the upper portions of the riser.

C. INSTALLATION REQUIREMENTS

Southern Right-of-Way
PIGGING LOOP, PIGGING JUMPER, JACKET RISER AND SCR SPECIFICATIONS
KERR-MCGEE OIL & GAS CORPORATION
7-INCH X 4.5-INCH PIPE-IN-PIPE FLOWLINE SYSTEM WITH PIGGING LOOP AND JUMPER
Garden Banks Block 258 Well No. 2 ST02BP01 TO GARDEN BANKS BLOCK 260 PLATFORM 'A'

The flowline will be installed in water depths from 2,325' in Garden Banks Area Block 302 to 1,650' in Garden Banks Area Block 260 Platform 'A'. The flowline is located in water depths greater than 200 feet; therefore flowline burial will not be required.

D. CONSTRUCTION INFORMATION

1. Proposed Construction Commencement date is Jan 2008
2. Onshore Construction Base will be in Fourchon, LA
3. The pipeline will be installed by dynamically positioned vessel.
4. The pipeline will not be buried.
5. Time Required to Construct Line/Complete Project: 4 months

Anadarko
Petroleum Corporation



A	08/03/2007	Issue for Review and Comments	HHL			
Rev	Date	Description	Originator	Check	Project	Client

Keywords: Document Control Format
Comments: n/a/n/a

SUMMARY OF DESIGN AND ANALYSES ON 4.5-INCH STEEL CATENARY RISER

This document summarizes the results of the detailed design and analyses on Anadarko Petroleum Corporation (Anadarko) Power Play two 4-inch steel catenary risers (SCRs) connected to Baldpate Platform at Garden Bank 260.

The proposed SCRs will be hung-off at the elevation of (-) 220 feet at Leg Joint B1 of Baldpate platform where the water depth is 1,652 feet. Each proposed 4-inch SCR includes a tapered steel stress joint of approximately 25 feet in length and the maximum outside diameter of 7.50 inches at the hang-off clamp. It also includes approximately 400 feet of fairings to suppress vortex induced vibration (VIV). The proposed SCRs are covered by a FBE corrosion coating with thickness of 12 to 14 mils and a 2-inch GSPU thermal insulation coating.

The following sections summarize the analysis results that verify the integrity of the SCRs during the service life under operation and extreme load conditions.

1. Riser Wall Thickness Verification

The pipe wall thickness was calculated in accordance with API RP 1111. The detailed results are presented in Table 1 for MAOP of 10 ksi and corrosion allowance (C.A.) of 0.118 inches, and Table 2 for MAOP of 12 ksi in early years of production and C.A. of 0.039 inches.

Table 1 Pipe Wall Thickness – 10 ksi

API 5L Steel Grade	API RP 1111 Burst	API RP 1111 Burst with C.A. = 0.118 inches	API RP 1111 Collapse	API RP 1111 Buckle Propagation	Selected Wall Thickness
X-65	0.517 inch	0.635 inch	0.116 inch	0.203 inch	0.648 inch

Table 2 Pipe Wall Thickness – 12 ksi

API 5L Steel Grade	API RP 1111 Burst	API RP 1111 Burst with C.A. = 0.039 inches	API RP 1111 Collapse	API RP 1111 Buckle Propagation	Selected Wall Thickness
X-65	0.605 inch	0.644 inch	0.116 inch	0.203 inch	0.648 inch

2. Riser Static Analysis

The static analyses were conducted by a finite element model of FLEXCOM. The results of static analyses are summarized in Table 3 for the conditions of the

maximum allowable operation pressure of 12 ksi and MAOP of 10 ksi with corrosion allowance. The maximum design stress is within the maximum allowable limits per API RP 1111. The static configuration of the SCR is presented in Exhibit R003.

Table 3, SCR Static Analysis Results
Operation, P=12 ksi and and P=10 ksi with Corrosion Allowance

System Pressure (psi)	Top Angle (deg)	Top Tension (kip)	SCR TDP Distance (ft)	SCR Suspended Length (ft)	Max. Stress of SCR (%SMYS)		
					Bending Stress	Long. Stress	Von Mises Stress
12,000	15	35.52	1,035	1,885	16.16%	29.76%	65.65%
10,000	15	37.64	1,035	1,885	16.22%	31.79%	65.14%

Table 4 shows the results under installation and hydrotest conditions. The maximum hydrotest stress is within the maximum allowable limits per 30 CFR Part 250.

Table 4, SCR Analysis Results
(Installation and Hydrostatic Test)

Conditions	Top Angle (deg)	Top Tension (kip)	SCR TDP Distance (ft)	SCR Suspended Length (ft)	Max. Stress of SCR (%SMYS)		
					Bending Stress	Long. Stress	Von Mises Stress
Installation	15	29.61	1,040	1,890	16.03%	9.36%	17.62%
Hydrotest	15	36.48	1,035	1,885	16.18%	34.74%	82.15%

3. Riser Dynamic Analysis

In addition to the static analysis, a dynamic analysis for the FLEXCOM FE model is performed to determine the effects of extreme loads on the SCR. The 100 year hurricane storm waves and associated currents are considered as one of the worst cases. Three directions of waves and associated currents and offsets were applied in the dynamic analysis. The results are given in Table 5. All the dynamic analyses are conducted with internal fluid of products and under operation pressure of 10 ksi.

Table 5, SCR Dynamic Analysis Results
(Under the 100-year Hurricane Storm Conditions)

Platform Position	Wave Direction (deg.)	Max. Top Tension (kip)	Max. Bending Moment (kip-ft)	Max. Von Mises Stress of SCR (ksi)	Max. Allowable Von Mises Stress (ksi)
In-Plane Taut	0	36.29	23.84	43.00	58.5
Out-Plane	90	35.82	58.62	43.92	58.5
In-Plane Slack	180	37.29	60.40	44.99	58.5

The integrity of the proposed SCRs was also examined under extreme loop current and associated wave conditions. The maximum strain under the 100-year loop current and associated wave conditions is approximately 0.27 percent which satisfies the maximum strain limits developed based on API RP 1111.

Therefore, the results of dynamic analyses verified the integrity of the proposed SCRs under extreme load conditions.

4. Riser Fatigue Analysis

Riser fatigue analysis includes current induced VIV fatigue analysis and wave induced fatigue analysis.

The current induced VIV fatigue life was evaluated using the computer program SHEAR7. Modes analysis module of FLEXCOM was applied to generate the SCR natural frequencies and mode shapes for the VIV fatigue analysis. The VIV fatigue analysis was performed in accordance with the procedures specified and related codes. The current profiles specified in the Metocean data document were applied in the analysis. All modeling parameters were specified according to the applicable reference documents. The analysis results show that the minimum cumulative VIV fatigue life is approximately 7,098 years by utilizing the API S-N X' curve. The minimum survival fatigue life due to a single 100-year loop current event is approximately 34.8 days which is greater than the required 30 hours per API RP 1111. This proves the adequacy of the top 400 feet VIV suppressor coverage.

The wave induced fatigue analysis was performed using FLEXCOM model and its LIFETIME post-processing module. The eight directions of waves were specified in the Metocean data document, each with twenty three sea states. For conservative and simplification considerations, the probabilities of the eight direction waves were combined into three directions, 0, 90 and 180 degree. All modeling parameters were specified according to the applicable reference documents. The analysis results indicate that the minimum cumulative wave

induced fatigue life is approximately 8,825 years by applying the API S-N X' curve.

For the worst scenario (assuming that VIV fatigue damage and wave induced fatigue damage happen at the same location), the combined minimum fatigue life of VIV fatigue and wave induced fatigue would be 3,934 years. Therefore, the combined minimum fatigue life will exceeds the required minimum of 200 years per API RP 1111.

5. Clearance Analysis

The clearance analyses on the two proposed 4.5-inch SCR, one 4.9-inch umbilical and adjacent Walter west SCR were conducted using CLEAR module integrated with the computer software FLEXCOM. The clearance analyses were based on the data base generated by the static and dynamic analyses on the SCRs and the umbilical.

Static clearance analysis demonstrates that the minimum clearance of 2.29 feet was observed between the proposed Power Play north SCR and south SCR at the location of hang-off.

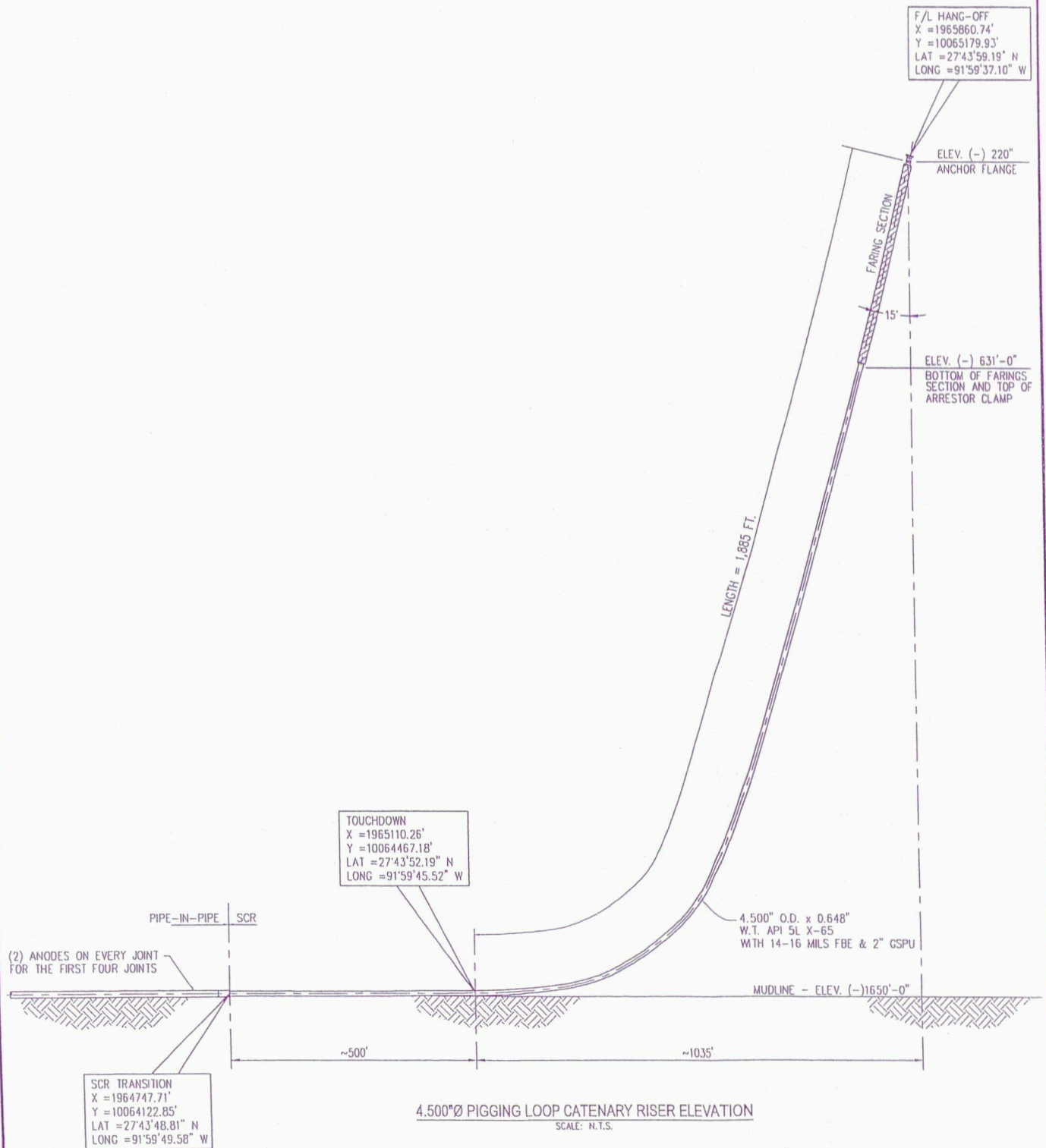
Dynamic clearance analysis evaluated eight extreme load cases, which are considered to adequately reflect all possible critical scenarios. The modeling results indicate that the minimum clearance of 2.29 feet was observed between the proposed Power Play north SCR and south SCR at the location of hang-off.

The value of the achieved minimum clearance is greater than the two times of total diameter of SCR. Therefore, it can be concluded that no clashing is anticipated between the proposed Power Play north SCR and the umbilical, or between the proposed Power Play north and south SCRs, or between the proposed Power Play south SCR and Walter west SCR.

6. Conclusions

The proposed two 4.5-inch SCRs have been designed to withstand all loads associated with installation, testing and operation. The conducted SCR wall thickness verification, static analysis, dynamic analysis, current induced VIV fatigue and wave induced fatigue analyses, and clearance analysis demonstrate that the design meets the requirements of the current codes, standards and specifications, supplemented by accepted industry engineering practice. The integrity of the SCRs has been verified under operation and extreme load conditions.

Plot: Friday, August 31, 2007 10:39:30 AM BY: WALTER VALOIS LAST SAVE: 8/31/2007 10:07:18 AM FILE NAME: I:\ANADARKO\2019499 POWERPLAY PIPELINE\2019499W018



GB-302/258 POWERPLAY DEVELOPMENT

SOUTH SCR CONFIGURATION

DWG NO. 02019499W018

JOB NO. 02019499

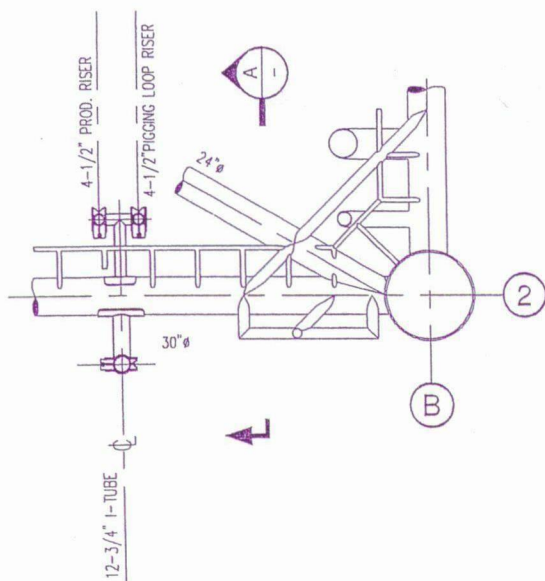
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SCALE VALID FOR A-SIZE DRAWING (8.5" x 11") ONLY. REV. A

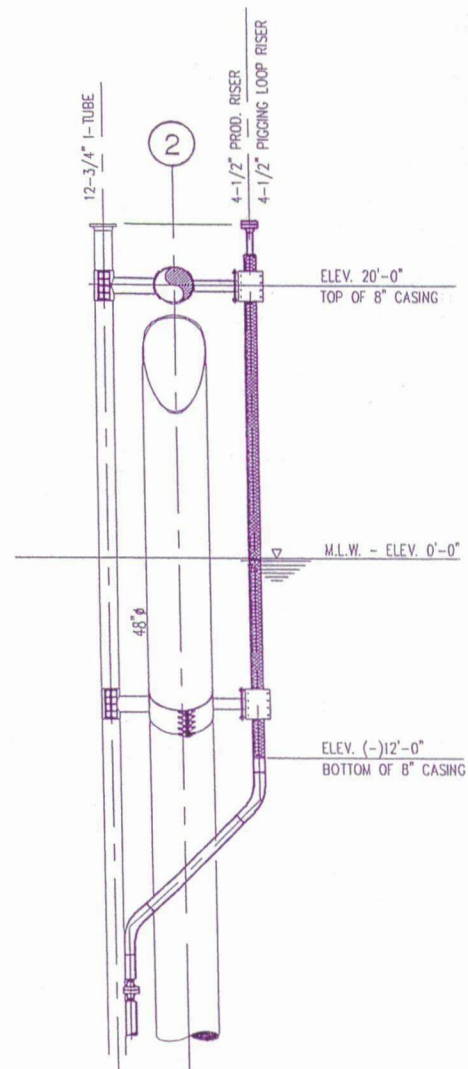
DRAWN BY: W. VALOIS

ORIGIN. DATE: 08/30/07

REV. DATE:



PLAN VIEW



SECTION
SCALE: AS-SHOWN



GB-302/258 POWERPLAY DEVELOPMENT

JACKET RISER PROTECTION DETAILS

DWG NO. 2019499W016

JOB NO. 2019499

SCALE: NTS

SCALE VALID FOR A-SIZE
DRAWING (8.5" x 11") ONLY.

REV.
A

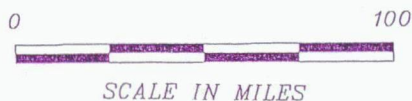
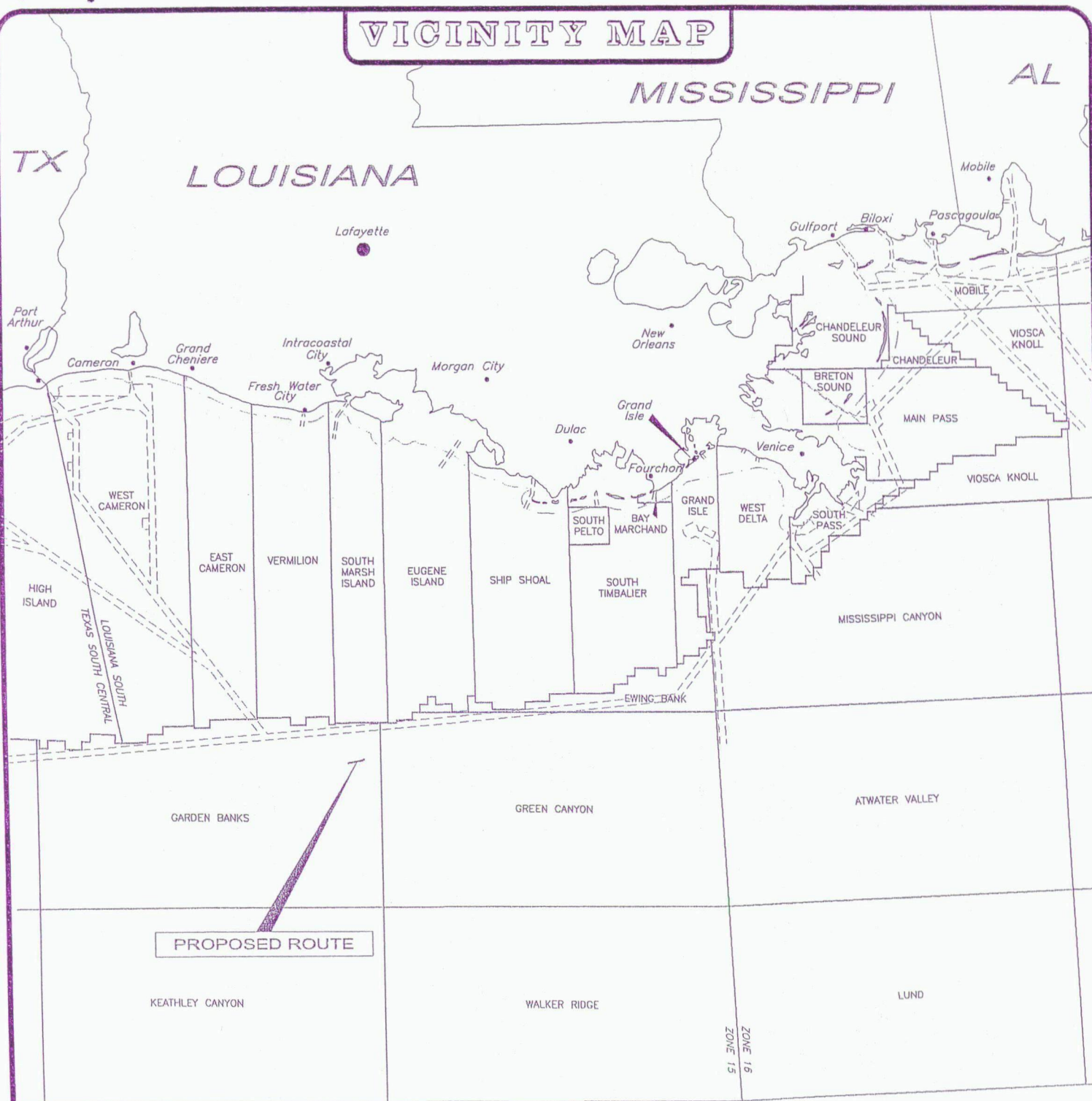
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REV. DATE:

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VICINITY MAP



GULF OF MEXICO

DATE: 08/02/2007 TIME: 11:06 FILENAME: J:\072454-072758\PERMITS\PRM072454CVR.DWG

Anadarko
Petroleum Corporation

PROPOSED PIP 4.5"x7.625" OIL & GAS SOUTH TIE-BACK
Block 302 PLET to Block 260 "A" Platform
Garden Banks Area

PREPARED
BY:



C&C Technologies
SURVEY SERVICES

739 E. WALSH SALOON ROAD, LAFAYETTE, LA (337) 261-0660

JOB No: 072454-072758

REVISED:

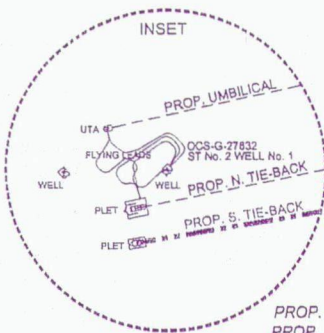
DATE: August 2, 2007

FILENAME: PRM072454CVR.DWG

SHEET 1 of 4



GB257
OCS-G-30774
KERR-MCGEE



TOTAL LENGTH = 33,189.40' = 6.29 statute miles

PROPOSED PIP 4.5"x7.625" OIL & GAS SOUTH TIE-BACK

GB258
OCS-G-27632
NEWFIELD/KERR-MCGEE

N80°37'08"E
26,239.64'

PROP. PIP 4.5"x7.625" O & G NORTH TIE-BACK
PROP. 4.9" UMBILICAL

SEE INSET

GB301
OCS-G-24478
HESS

71+59.49'
BLOCKLINE CROSSING
X= 1,941,294.03'
Y= 10,058,400.00'
Lat= 27°42'53.952"N
Lon= 92°04'11.118"W

GB302
OCS-G-24479
SHELL/WALTER/KERR-MCGEE

00+00.00' OCS-G-27632
GB258 ST No. 2 WELL No. 1 PLET
X= 1,934,230.29'
Y= 10,057,233.00'
Lat= 27°42'42.915"N
Lon= 92°05'29.828"W

MILITARY
WARNING AREA
W-147AB

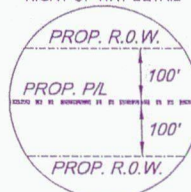
STATE OF LOUISIANA
RALPH A. COLEMAN
THE PROPOSED ROUTE IS ACCURATELY
REPRESENTED AND REGISTERED
PROFESSIONAL
LAND SURVEYOR
RALPH A. COLEMAN SURVEY
PROFESSIONAL LAND SURVEYOR
LOUISIANA REGISTRATION No. 4691

PLAN



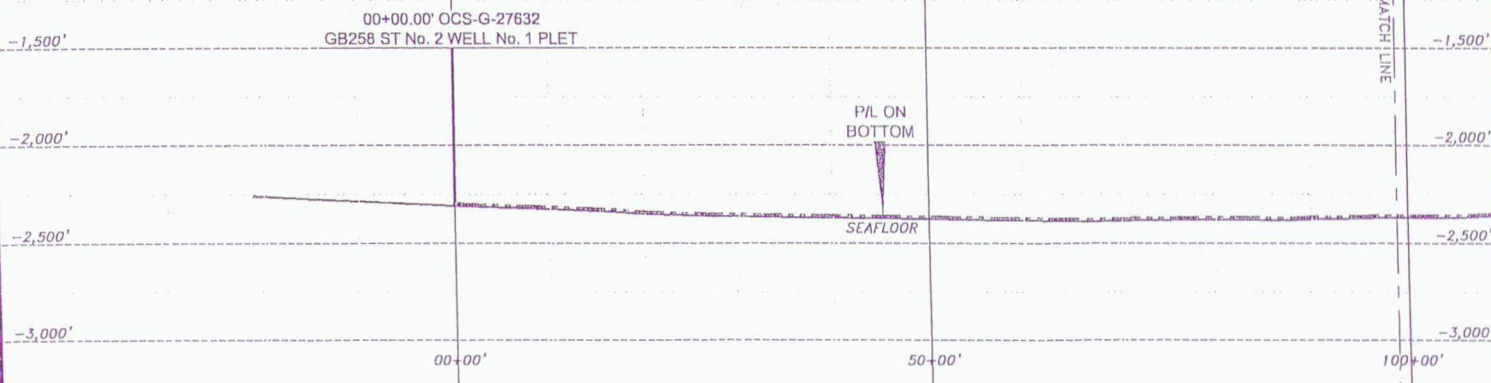
NADCON version 2.1 utilized for
WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL



FOR PERMITTING ONLY. STATIONING AND LENGTHS
REFER TO HORIZONTAL DISTANCE(S) ONLY.

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 15N
CENTRAL MERIDIAN: 93°00' W
FALSE EASTING: 1,640,416.87 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00°00' N



PROFILE

HORIZONTAL SCALE: 1" = 2000'
VERTICAL SCALE: 1" = 1000'

VERTICAL EXAGGERATION = 2

DATE: 08/02/2007 TIME: 17:22 FILENAME: J:\072454-072758\PERMITS\PRM072454STB.DWG

Anadarko
Petroleum Corporation

PROPOSED PIP 4.5"x7.625" OIL & GAS SOUTH TIE-BACK
Block 302 PLET to Block 260 "A" Platform
Garden Banks Area

PREPARED
BY:



C&C Technologies
SURVEY SERVICES

230 E. KLEIGH SALCOM RD., LAFAYETTE, LA 70503-2601-0886

JOB No: 072454-072758

REVISED:

DATE: Aug. 2, 2007

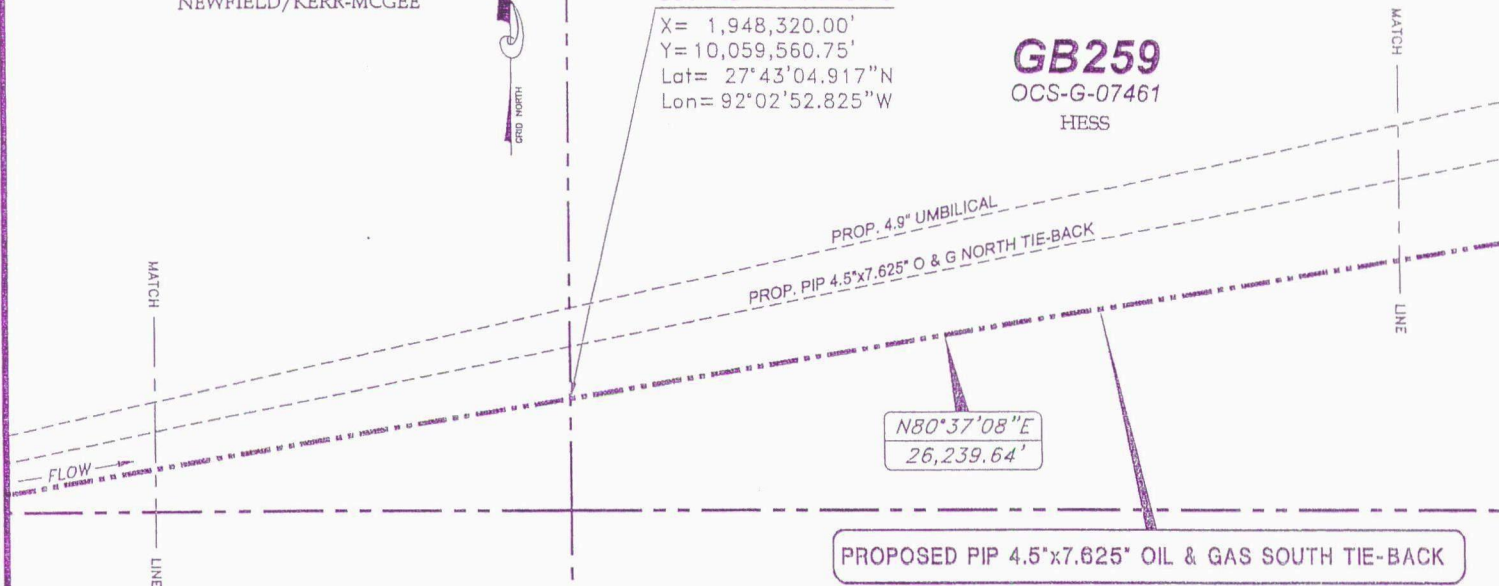
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SHEET 2 of 4

GB258
OCS-G-27632
NEWFIELD/KERR-MCGEE

142+80.70'
BLOCKLINE CROSSING
X= 1,948,320.00'
Y= 10,059,560.75'
Lat= 27°43'04.917"N
Lon= 92°02'52.825"W

GB259
OCS-G-07461
HESS



GB302
OCS-G-24479
SHELL/WALTER/KERR-MCGEE

GB303
OCS-G-30781
REMINGTON

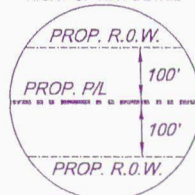
MILITARY
WARNING AREA
W-147AB

PLAN



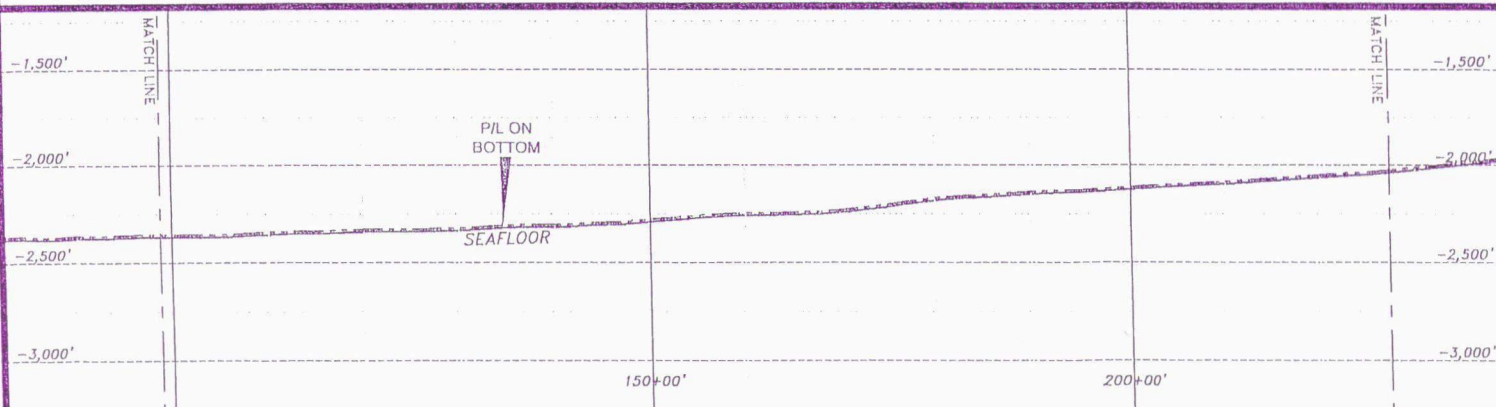
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WGS84-NAD27 conversions.

RIGHT-OF-WAY DETAIL

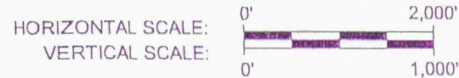


FOR PERMITTING ONLY. STATIONING AND LENGTHS
REFER TO HORIZONTAL DISTANCE(S) ONLY.

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 15N
CENTRAL MERIDIAN: 83° 00' W
FALSE EASTING: 1,840,410.87 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N



PROFILE



VERTICAL EXAGGERATION = 2

DATE: 08/02/2007 TIME: 17:22 FILENAME: J:\072454-072758\PERMITS\PRM072454STB.DWG

Anadarko
Petroleum Corporation

PROPOSED PIP 4.5"x7.625" OIL & GAS SOUTH TIE-BACK
Block 302 PLET to Block 260 "A" Platform
Garden Banks Area

PREPARED
BY:



C&C Technologies
SURVEY SERVICES

120 L. BAILEY SULLOW ROAD, CHATEAU, LA. (337) 261-0860

JOB No: 072454-072758

REVISED:

DATE: Aug. 2, 2007

FILENAME: PRM072454STB.DWG

SHEET 3 of 4

TOTAL LENGTH = 33,189.40' = 6.29 statute miles

PROPOSED PIP 4.5"x7.625" OIL & GAS SOUTH TIE-BACK

CURVE 1 DATA	
PC1	262+39.64'
X=	1,960,119.00'
Y=	10,061,510.06'
Lat=	27°43'23.304"N
Lon=	92°00'41.335"W
PT1	306+98.81'
X=	1,964,054.09'
Y=	10,063,464.64'
Lat=	27°43'42.349"N
Lon=	91°59'57.362"W
PI1	
X=	1,962,385.95'
Y=	10,061,884.58'
R=	7,500.00'
T=	2,297.68'
Δ=	34°03'56"
L=	4,459.18'

GB259

OCS-G-07461

HESS

316+54.40'

TRANSITION POINT

X= 1,964,747.86'

Y= 10,064,121.78'

Lat= 27°43'48.802"N

Lon= 91°59'49.580"W

N46°33'12"E

1,035.00'

S-15947 HESS 3" (Permitted)

S-15946 HESS 6" (Permitted)

331+89.40' HANG-OFF
HESS "A" PLATFORM

X= 1,965,862.30'

Y= 10,065,177.36'

Lat= 27°43'59.167"N

Lon= 91°59'37.080"W

321+54.39'

TOUCHDOWN POINT

X= 1,965,110.87'

Y= 10,064,465.61'

Lat= 27°43'52.178"N

Lon= 91°59'45.509"W

N46°33'12"E

500.00'

S-17015 WALTER 4" (Permitted)

S-17017 WALTER 4" (Permitted)

S-17016 WALTER 3" (Umbilical)(Permitted)

N46°33'12"E

955.58'

308+44.69'

BLOCKLINE CROSSING

X= 1,964,160.00'

Y= 10,063,564.95'

Lat= 27°43'43.334"N

Lon= 91°59'56.174"W

GB260

OCS-G-07462

HESS

MILITARY
WARNING AREA
W-51A

N80°37'08"E

26,239.64'

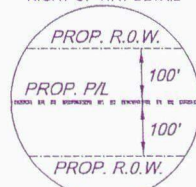
PLAN

0' 2000'

SCALE IN US SURVEY FEET

NADCON version 2.1 utilized for
WGS84-NAD27 conversions.

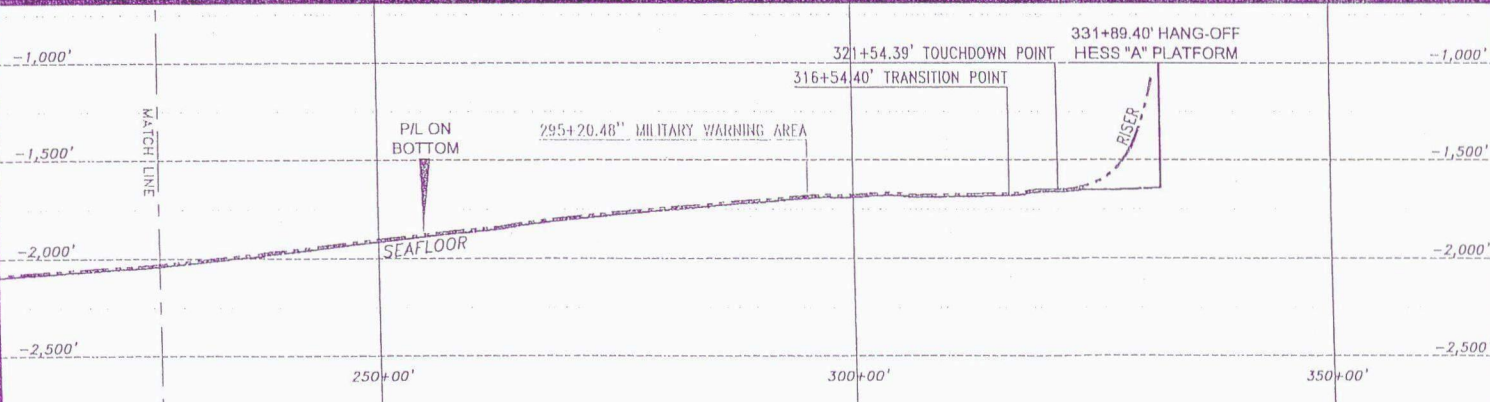
RIGHT-OF-WAY DETAIL



FOR PERMITTING ONLY. STATIONING AND LENGTHS
REFER TO HORIZONTAL DISTANCE(S) ONLY.

GEODETIC DATUM: NAD27
ELLIPSOID: CLARKE 1866
GRID UNITS: U.S. SURVEY FEET
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
ZONE: 15N
CENTRAL MERIDIAN: 83° 00' W
FALSE EASTING: 1,640,416.07 ft. at C.M.
FALSE NORTHING: 0.00 ft. at 00° 00' N

PROFILE



HORIZONTAL SCALE: 0' 2,000'
VERTICAL SCALE: 0' 1,000'

VERTICAL EXAGGERATION = 2

DATE: 08/02/2007 TIME: 17:22 FILENAME: J:\072454-072758\PERMITS\PRM072454STB.DWG

Anadarko
Petroleum Corporation

PROPOSED PIP 4.5"x7.625" OIL & GAS SOUTH TIE-BACK
Block 302 PLET to Block 260 "A" Platform
Garden Banks Area

PREPARED BY: C&C Technologies
SURVEY SERVICES
739 E. BRISTOL ST. BOULDER, CO 80501 (303) 440-0000

JOB No: 072454-072758
FILENAME: PRM072454STB.DWG

REVISED:

DATE: Aug. 2, 2007
SHEET 4 of 4

Online Payment

Step 3: Confirm Payment

11213

Thank you.

Your transaction has been successfully completed.

Pay.gov Tracking Information

Application Name: Pipeline ROW Grant Application - XCI/XRG/XBZ/XCM

Pay.gov Tracking ID: 24UD1L9V

Agency Tracking ID: 74034763072

Transaction Date and Time: 10/17/2007 14:39 EDT

Payment Summary

Address Information	Account Information	Payment Information
Account Holder Name: Judy Davidson 1280 Lake Robbins Billing Address: Drive Billing Address 2: City: The Woodlands State / Province: TX Zip / Postal Code: 77380 Country: USA	Card Type: Master Card Card Number: *****0809 Expiration Date: 1 / 2008 Region: Gulf of Mexico Judy Davidson Contact: (832) 636-8766 Kerr-McGee Oil Company/Co & Gas No: Corporation 02219 Originating Garden Banks GB, Area/Block: 302 Terminating Garden Banks GB, Area/Block: 260 Pipeline Length/Rental 7/5 Years:	Payment Amount: \$2,875.00 Transaction Date 10/17/2007 and Time: 14:39 EDT

17332/33